

Appl. No. 09/619,520
Amdt. dated May 27, 2004
Reply to Office Action of February 27, 2004

PATENT

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings of claims in the application:

Listing of Claims:

- 1 1. (Currently Amended) An apparatus for pumping and sterilizing or
2 disinfecting fluids liquid held in a reservoir, comprising:
3 a fluid conduit, which is at least partially submerged in the liquid held in the
4 reservoir;
5 a ultraviolet light source which is at least partially within the fluid conduit, the
6 ultraviolet light source comprising a protective sleeve surrounding at least a portion of the
7 ultraviolet light source and protecting the ultraviolet light source from breaking; and
8 an air drive unit coupled to the fluid conduit and adapted to cause a liquid to flow
9 through the fluid conduit and past the at least a portion of the ultraviolet light source, wherein
10 said ultraviolet light source generates an ultraviolet light which kills microorganisms in the
11 liquid and said fluid conduit.
- 1 2. (Previously Presented) The apparatus as recited in claim 1, wherein said
2 ultraviolet light source comprises a casing for holding a gas and a vaporizable material, and at
3 least one electrode electrically coupled to a power source for exciting said gas and said
4 vaporizable material.
- 1 3. (Original) The apparatus as recited in claim 2, wherein said protective
2 sleeve comprises a UV transmissive material.
- 1 4. (Original) The apparatus as recited in claim 3, wherein said protective
2 sleeve is a fluoropolymer sleeve.
- 1 5. (Original) The apparatus as recited in claim 2, wherein said casing
2 comprises a fluoropolymer casing.

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1 6. (Previously Presented) The apparatus as recited in claim 2 4, wherein said
2 casing comprises a quartz or glass casing and said fluoropolymer sleeve surrounds said quartz or
3 glass casing.

1 7. (Original) The apparatus as recited in claim 3, wherein said protective
2 sleeve comprises a silicon polymer or silicone material.

1 8. (Original) The apparatus as recited in claim 4, wherein said
2 fluoropolymer sleeve is made from a fluoropolymer selected from the group of fluoropolymers
3 including, PTFE, FEP, PFA, AF, and Tefzel ETFE.

1 9. (Cancelled)

1 10. (Original) The apparatus as recited in claim 2, wherein said protective
2 sleeve comprises a removable container.

1 11. (Previously Presented) The apparatus as recited in claim 2, wherein said
2 protective sleeve hermetically seals said ultraviolet light source.

1 12. (Cancelled)

1 13. (Previously Presented) The apparatus as recited in claim 6, wherein said
2 fluoropolymer sleeve is heat shrunk around said quartz or glass casing of said ultraviolet light
3 source.

1 14. (Previously Presented) The apparatus as recited in claim 6, wherein said
2 fluoropolymer sleeve is form pressed around said quartz casing of said ultraviolet light source.

1 15. (Previously Presented) The apparatus as recited in claim 6, wherein said
2 fluoropolymer sleeve is formed around said quartz or glass casing of said ultraviolet light source
3 by dipping said ultraviolet light source into a liquid material.

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1 16. (Previously Presented) The apparatus as recited in claim 1, further
2 comprising a power source, wherein said power source is a solar power source connected to said
3 ultraviolet light source, and wherein said protective sleeve surrounds said solar power source and
4 said ultraviolet light source and hermetically seals said solar power source with said ultraviolet
5 light source.

1 17. (Previously Presented) The apparatus as recited in claim 1, wherein said
2 ultraviolet light source comprises a first end portion, a second end portion, and an elongated
3 body portion formed between said first end portion and said second end portion, and wherein
4 said protective sleeve comprises a fluoropolymer sleeve covering at least a portion of said
5 elongated body portion and first and second end caps covering said first and said second end
6 portions, respectively, and forming a seal with the fluoropolymer sleeve.

1 18. (Original) The apparatus as recited in claim 17, wherein said first and said
2 second end caps comprise fluoropolymer end caps.

1 19. (Original) The apparatus as recited in claim 17, wherein said first and said
2 second end caps comprise silicone end caps.

1 20. (Original) The apparatus as recited in claim 17, wherein said first and said
2 second end caps are sealed to said protective sleeve using a silicone sealer.

1 21. (Cancelled)

1 22. (Currently Amended) A method of pumping and sterilizing or disinfecting
2 a fluid liquid held in a reservoir, comprising the steps of:

3 positioning a fluid conduit at least partially submerged in the liquid held in the
4 reservoir;

5 placing an ultraviolet light source at least partially within a the fluid conduit, the
6 ultraviolet light source comprising a protective sleeve surrounding at least a portion of the
7 ultraviolet light source and preventing the ultraviolet light source from breaking;

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8 pumping air into the fluid conduit to pump liquid through the fluid conduit and
9 past at least a portion of the ultraviolet light source; and
10 illuminating said ultraviolet light source so that an ultraviolet light is generated,
11 killing microorganisms in the liquid and said fluid conduit.

1 23. (Original) The method as recited in claim 22, wherein said ultraviolet
2 light source comprises a casing for holding a gas and a vaporizable material, and at least one
3 electrode electrically coupled to said power source for exciting said gas and said vaporizable
4 material.

1 24. (Original) The method as recited in claim 23, wherein said protective
2 sleeve is a fluoropolymer sleeve.

1 25. (Original) The method as recited in claim 23, wherein said casing
2 comprises a fluoropolymer casing.

1 26. (Previously Presented) The method as recited in claim 24, wherein said
2 casing comprises a quartz or glass casing and said fluoropolymer sleeve surrounds said quartz or
3 glass casing.

1 27. (Previously Presented) The method as recited in claim 24, wherein said
2 fluoropolymer sleeve is made from a fluoropolymer selected from the group of fluoropolymers
3 including, PTFE, FEP, PFA, AF, and Tefzel ETFE.

1 28. (Original) The method as recited in claim 23, wherein said protective
2 sleeve comprises a silicon polymer or silicone material.

1 29. (Cancelled)

1 30. (Original) The method as recited in claim 22 , wherein a protective sleeve
2 comprises a removable container.

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1 31. (Previously Presented) The method as recited in claim 22, wherein a
2 protective sleeve hermetically seals said ultraviolet light source.

1 32. (Cancelled)

1 33. (Previously Presented) The method as recited in claim 26, wherein the
2 fluoropolymer sleeve is heat shrunk around said quartz or glass casing of said ultraviolet light
3 source.

1 34. (Previously Presented) The method as recited in claim 26, wherein the
2 fluoropolymer sleeve is form pressed around said quartz or glass casing of said ultraviolet light
3 source.

1 35. (Previously Presented) The method as recited in claim 24, wherein said
2 fluoropolymer sleeve is formed around said quartz or glass casing of said ultraviolet light source
3 by dipping said ultraviolet light source into a fluoropolymer liquid material.

1 36. (Previously Presented) The method as recited in claim 22, wherein said
2 power source is a solar power source connected to an ultraviolet light source, and wherein a
3 protective sleeve surrounds said solar power source and said ultraviolet light source and
4 hermetically seals said solar power source with said ultraviolet light source.

1 37. (Previously Presented) The method as recited in claim 22, wherein a
2 ultraviolet light source comprises a first end portion, a second end portion, and an elongated
3 body portion formed between said first end portion and said second end portion, and wherein
4 said protective sleeve comprises a fluoropolymer sleeve covering at least a portion of said
5 elongated body portion and first and second end caps covering said first and said second end
6 portions, respectively, and forming a seal with the fluoropolymer sleeve.

1 38. (Original) The method as recited in claim 37, wherein said first and said
2 second end caps comprise fluoropolymer end caps.

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1 39. (Original) The method as recited in claim 37, wherein said first and said
2 second end caps comprise silicone end caps.

1 40. (Original) The method as recited in claim 37, wherein said first and said
2 second end caps are sealed to said protective sleeve using a silicone sealer.

1 41. (Cancelled)

1 42. (Cancelled)